# kajaaniROTARY™ Get a better view of consistency control





The new kajaaniROTARY transmitter expands Metso's offering in the category of shear force based consistency measurement. It is suitable especially for chemical pulp mills and bleaching applications at RCF or mechanical pulp mills. It features durability, accuracy, operability, and self-diagnostics – the well-known qualities of all Kajaani products.



# **kajaaniROTARY™** – soon another industry standard

Selecting a correct transmitter is a straightforward procedure when you base your decision on investment cost and measurement performance. For example, a microwave transmitter is the best choice if you are after high accuracy or total consistency measurement, or if your fiber properties often vary due to pulp grade changes. At chemical pulp mills, however, the use of microwave transmitters is sometimes limited due to the chemistry of the process.

Fiber consistency transmitters based on shear force technology have been widely used in pulp and paper applications for over fifty years. Today, they make up the majority of all consistency transmitters in operation. Shear force technology is basically split into blade and rotating transmitters. A blade transmitter is an economical choice for most applications and provides performance similar to rotating transmitters. However, a blade transmitter's installation requirements can be challenging, especially with large process lines. For example, requirements for straight pipe sections can limit its use. kajaaniROTARY offers more flexibility in this respect and also offers better sensitivity in medium and high consistency applications than other rotary transmitters.



The operating unit (TCU) is an efficient tool for configuration, calibration and maintenance diagnostics.



kajaaniROTARY is available with different sensors and materials. Its wide measurement dynamics ensure excellent performance from 1.5 to 18% Cs. Wetted parts can be made of AISI 316L or 254 SMO<sup>®</sup>/Hastelloy C for bleaching applications.



Transmitter selection is easy when the required control perfor and the process conditions have been clarified. kajaaniROTA Metso Automation's portfolio.

## Precision as never before

A robust design as well as excellent repeatability and sensitivity – these are the requirements for a superior rotary transmitter. Naturally, such a transmitter must also endure high pressure and process temperatures in harsh process conditions. The key to meeting all these requirements lies in a winning combination of precision mechanics, robust design and modern electronics.

Accurate raw measurement signals form the basis for good instrument practice. The basic performance is set and necessary compensations must be made at the early stages. In kajaaniROTARY, the ambient temperature effect is compensated, ensuring excellent performance after a cold start-up or rapid process changes.

Since the effect of rotating speed variation is also compensated, possible power supply frequency variation or random peaks in consistency at the mill do not disturb measurement either. All these factors contribute to accurate phase shift measurement.

> Typical kajaaniROTARY applications at a chemical pulp mill include washing, screening and bleaching. Accurate washing and screening control ensures maximum production capacity with high quality pulp. The role of consistency control in bleaching is critical when you aim at optimal chemical dosing. Consistency control also forms the basis for upper level bleaching controls.

Typical kajaaniROTARY applications:

Chemical pulping

- Screening
- Washing
- Bleaching

Mechanical pulping and RCF • Bleaching

The current controller is the heart of the transmitter, running the phase shift measurement to a fixed set point value. The adaptive controller keeps the response time constant and fast. Self-diagnostics analyzes controller performance continuously and reports all disturbances to the operator.

Current measurement is converted to torque with a resolution that is thousands of times more accurate than that of other rotating transmitters on the market. This ensures much wider measurement dynamics than ever before. Torque measurement can be converted to shear force measurement after process temperature compensation. The temperature affects both pulp viscosity and fiber stiffness, which must be taken into account. Accurate and compensated shear force measurement is now ready for further calculations.

# **Commissioning is quick**

Like all Metso Automation's blade transmitters, kajaaniROTARY is equipped with ready-made calibration curves for different sensors and pulp grades. These curves convert shear force measurement to consistency measurement. Single- or two-point calibration can made for quick commissioning. Versatile multi-point calibration is available for special pulp grades and MC consistencies.

# Self-diagnostics – of course

Today, self-diagnostics is a must. The instrument must be able to analyze its own performance continuously and report it to the control room or the asset management system. kajaaniROTARY features a complete DTM description for the FieldCare<sup>™</sup> system, making all rele-



High conductivity



rmance is clear \RY completes



kajaaniROTARY can be installed using a mounting chamber (up to DN250/10" lines) or process coupling (lines DN300/12" or larger). DIN/ANSI/JIS pipe standards are supported.



The performance of kajaaniROTARY vs. the best-selling shear force transmitter applied to a washer after the  $O_2$  stage at a chemical pulp mill.

vant measurement data such as consistency, temperature, rotating speed and performance diagnostics available for the users. Since the alarm and warning limits are adjustable, the transmitter can be customized to different applications. kajaaniROTARY's maintenance diagnostics provide service staff with access to all raw measurement data and detailed diagnostics.



🛑 kajaaniROTARY

# Specifications and process conditions

Measuring ra <mark>nge</mark>	1.518% Cs (see table below for more specific data)							
Repeatability	0.01% Cs							
Sensitivity	0.001% Cs							
Damping	160 s							
Ambient temperature	-20+70 °C (-4158 °F)							
kaiaaniROTARY sensors:								
Sensors	See table below for more specific data							
Enclosure class	IP66 (NEMA4X)							
Housing	Aluminum alloy							
Wetted materials	AISI 316L, 254 SMO <sup>®</sup> or Hastelloy C276							
	Mechanical seal: AISI 316L, Hastelloy C276							
	Wetted gaskets: EPDM, Kalrez							
Operating unit, TCU:								
Enclosure class	IP65 (NEMA4)							
Operating voltage	90260 VAC/0.1A							
Outputs: current output	Consistency 4-20 mA + HART <sup>®</sup> 1835 VDC							
Inputs	2 inputs, isolated 12-48 VDC							
Communication:	PC connection: RS-232							
	Profibus PA: 2005							
	Foundations <sup>™</sup> Fieldbus: 2006							
	Support for FieldCare: 2005							
Motor:								
Enclosure class	IP55 (optional IP56)							
Motor voltage	220-690 VAC/45-65 Hz (see technical specification	on						
-	for more details)							
Process conditions:								
Process temperature	0+120 °C (+32248 °F)							
pH range	1.5-13							
Pressure rating	PN10/PN25 (150/363 lbs.)							
Vibration	Max. 20 m/s <sup>2</sup> , 10-2000 Hz							

# Measurement range (% Cs) for different pulp types and sensors

Sensor type	ТМ		PL		РМ		РН	
Pulp type	Min	Max	Min	Max	Min	Max	Min	Max
SW	1.5	6.5	5	11	7	13	9	15
HW	1.6	7	5.5	12	7.5	14	10	16
GW	1.7	7	6.5	13	8	14	11	16
ТМР	1.7	7	6.5	13	8	14	11	16
RCF	1.8	8	7	13	8.5	15	12	18









254 SMO\* is a registered trademark of Outokumpu Stainless HART\* is a registered trademark of Hart Communication Foundation





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### Standard delivery content:

- Transmitter
- TCU with a sensor cable (10 m)
- Mounting kit
- User's manual

#### **Options:**

- Process chambers
- Process couplings
- Blind flanges

(See the technical specification sheet for more information)